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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/933,492	08/20/2001	David R. Hembree	00-0625.1	6973

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EXAMINER
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CHU, CHRIS C

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 07/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicati n No.

09/933,492

Applicant(s)

HEMBREE ET AL.

Examiner

Chris C. Chu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period of Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 52 ~ 66 and 70 ~ 77 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 52 ~ 66 and 70 ~ 77 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) g.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicant's amendment filed on April 1, 2003 has been received and entered in the case.

### ***Election/Restrictions***

2. The restriction requirement in Paper No. 4 is withdrawn by applicant's traversal.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 52 ~ 66 and 70 ~ 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cram in view of Khandros et al.

Regarding claim 52, Cram discloses in Figs. 2A ~ 2C and column 2, lines 43 ~ 53 a semiconductor component comprising:

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- a substrate (10) comprising a plurality of tested semiconductor components (12) including a plurality of good components (12F) and at least one defective component (12NF); and
- a plurality of conductors (14) on the substrate configured to provide electrical paths to the good components while electrically isolating the at least one defective component.

Cram does not disclose a plurality of terminal contacts on the conductors. However, Khandros et al. discloses in Fig. 8G a plurality of terminal contacts (840) on conductors (854). Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Cram by using the plurality of terminal contacts as taught by Khandros et al. The ordinary artisan would have been motivated to modify Cram in the manner described above for at least the purpose of the tips of the spring contacts being coplanar with one another (column 5, lines 22 ~ 23).

Regarding claim 53, Cram discloses in Figs. 2A ~ 2C and column 1, lines 63 ~ 67 the substrate comprising a semiconductor wafer and the components comprising semiconductor dice or semiconductor packages.

Regarding claim 54, Cram discloses in Figs. 2A ~ 2C the conductors comprising a metal laser patterned redistribution layer (16). Further, as to the language on line 2, “metal laser patterned redistribution layer”, even though product-by-process claims are limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process. In re Thorpe, 227

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USPQ 964, 966 (Fed. Cir. 1985) (citations omitted). A “product by process” claim is directed to the product per se, no matter how actually made, In re Hirao, **190 USPQ 15 at 17** (footnote 3). See also In re Brown, **173 USPQ 685**; In re Luck, **177 USPQ 523**; In re Fessmann, **180 USPQ 324**; In re Avery, **186 USPQ 116**; In re Wertheim, **191 USPQ 90** (**209 USPQ 254** does not deal with this issue); and In re Marosi et al., **218 USPQ 289** final product per se which must be determined in a “product by, all of” claim, and not the patentability of the process, and that an old or obvious product, whether claimed in “product by process” claims or not. Note that Applicant has the burden of proof in such cases, as the above caselaw makes clear.

Regarding claim 55, Cram discloses in Figs. 2A ~ 2C and column 2, lines 43 ~ 53 the conductors being configured to electrically connect multiple components in a cluster that excludes the at least one defective component.

Regarding claim 56, Cram discloses in Figs. 2A ~ 2C and column 2, lines 43 ~ 53 a semiconductor component comprising:

- a substrate (10) comprising a plurality of tested components (12), each component comprising a plurality of component contacts (16);
- the components (12) including a plurality of good components (12F) and a defective component (12NF); and
- a plurality of conductors (14) on the substrate configured to provide electrical paths for the component contacts on the good components and to electrically isolate, the component contacts on the defective component.

Cram does not disclose a plurality of terminal contacts on the good components in electrical communication with the conductors. However, Khandros et al. discloses in Fig. 8G a

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plurality of terminal contacts (840) on good components in electrical communication with conductors (854). Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Cram by using the plurality of terminal contacts as taught by Khandros et al. The ordinary artisan would have been motivated to modify Cram in the manner described above for at least the purpose of the tips of the spring contacts being coplanar with one another (column 5, lines 22 ~ 23).

Regarding claim 57, Cram discloses in Figs. 2A ~ 2C the conductors comprising a metal redistribution layer.

Regarding claim 58, Cram discloses in Figs. 2A ~ 2C and column 2, lines 43 ~ 53 the conductors being configured to electrically connect a plurality of good components in a cluster.

Regarding claim 59, Cram discloses in Figs. 2A ~ 2C and column 1, lines 63 ~ 67 the substrate comprising a semiconductor wafer, and the components comprising semiconductor dice or semiconductor packages.

Regarding claim 60, Cram discloses in Figs. 2A ~ 2C and column 2, lines 43 ~ 53 a semiconductor component comprising:

- a semiconductor die (10) comprising a plurality of integrated circuits (12) and a plurality of component contacts (16) in electrical communication with the integrated circuits;
- a plurality of conductors (14) on the die in electrical communication with the component contacts; and
- at least some of the conductors configured to interconnect or electrically isolate selected component contacts or selected terminal contacts to repair defects on the die.

Cram does not disclose a plurality of terminal contacts on the die in electrical communication with the conductors. However, Khandros et al. discloses in Fig. 8G a plurality of terminal contacts (840) on a substrate in electrical communication with conductors (854). Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Cram by using the plurality of terminal contacts as taught by Khandros et al. The ordinary artisan would have been motivated to modify Cram in the manner described above for at least the purpose of the tips of the spring contacts being coplanar with one another (column 5, lines 22 ~ 23).

Regarding claim 61, Khandros et al. discloses in Fig. 8D and Fig. 8F the terminal contacts comprising a ball grid array (844 in 840).

Regarding claim 62, Cram discloses in Figs. 2A ~ 2C the conductors comprising a metal laser patterned redistribution layer (16). Further, as to the language on line 2, “metal laser patterned redistribution layer”, even though product-by-process claims are limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process. In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted). A “product by process” claim is directed to the product per se, no matter how actually made, In re Hirao, **190 USPQ 15 at 17** (footnote 3). See also In re Brown, **173 USPQ 685**; In re Luck, **177 USPQ 523**; In re Fessmann, **180 USPQ 324**; In re Avery, **186 USPQ 116**; In re Wertheim, **191 USPQ 90** (**209 USPQ 254** does not deal with this issue); and In re Marosi et al., **218 USPQ 289** final product per se which must be

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determined in a “product by, all of” claim, and not the patentability of the process, and that an old or obvious product, whether claimed in “product by process” claims or not. Note that Applicant has the burden of proof in such cases, as the above caselaw makes clear.

Regarding claim 63, Cram discloses in Figs. 2A ~ 2C and column 2, lines 43 ~ 53 a test board for testing semiconductor components on a substrate comprising:

- a plurality of test sites on the test board (at the burn-in board) configured to electrically engage the components (12) on the substrate (10);
- the test sites comprising a plurality of conductors (14) configured to provide electrical paths to the components and to electrically isolate at least one component on the substrate.

Regarding claim 64, Cram discloses in Figs. 2A ~ 2C the conductors comprising a laser patterned metal layer (16). Further, as to the language on line 2, “laser patterned metal layer”, even though product-by-process claims are limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process. In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted). A “product by process” claim is directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 116; In re Wertheim, 191 USPQ 90 (209 USPQ 254 does not deal with this issue); and In re Marosi et al., 218 USPQ 289 final product per se which must be determined in a “product by, all of” claim, and not the



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patentability of the process, and that an old or obvious product, whether claimed in “product by process” claims or not. Note that Applicant has the burden of proof in such cases, as the above caselaw makes clear.

Regarding claim 65, Cram discloses in column 2, lines 43 ~ 53 the test board being configured to perform a burn-in test.

Regarding claim 66, Cram discloses in Figs. 2A ~ 2C and column 1, lines 63 ~ 67 the substrate comprising a wafer, and the components comprising dice or packages.

Regarding claim 70, Cram discloses in Figs. 2A ~ 2C and column 1, lines 63 ~ 67 a semiconductor component comprising:

- a semiconductor die (10) comprising a plurality of integrated circuits (12) including at least one defective integrated circuit (12NF); and
- a redistribution layer (14) on the die comprising a plurality of laser patterned conductors (18 and 20) configured to electrically isolate the terminal contacts from the at least one defective integrated circuits.
- a plurality of conductors (18 and 20) on the die in electrical communication with the component contacts; and
- at least some of the conductors configured to interconnect or electrically isolate selected component contacts or selected terminal contacts to repair defects on the die.

Cram does not disclose a plurality of terminal contacts on the die and an electrical connection between the terminal contacts to the integrated circuits by a plurality of laser patterned conductors. However, Khandros et al. discloses in Fig. 8G a plurality of terminal contacts (840) on a substrate and an electrical connection between the terminal contacts to the

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substrate by a plurality of laser patterned conductors (854). Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Cram by using the plurality of terminal contacts as taught by Khandros et al. The ordinary artisan would have been motivated to modify Cram in the manner described above for at least the purpose of the tips of the spring contacts being coplanar with one another (column 5, lines 22 ~ 23). Further, as to the language on line 5 from the bottom, "laser patterned conductors", even though product-by-process claims are limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process. In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted). A "product by process" claim is directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 116; In re Wertheim, 191 USPQ 90 (209 USPQ 254 does not deal with this issue); and In re Marosi et al., 218 USPQ 289 final product per se which must be determined in a "product by, all of" claim, and not the patentability of the process, and that an old or obvious product, whether claimed in "product by process" claims or not. Note that Applicant has the burden of proof in such cases, as the above caselaw makes clear.

Regarding claim 71, Khandros et al. discloses in Fig. 8D and Fig. 8F the terminal contacts comprising a ball grid array (844 in 840).

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Regarding claim 72, Cram discloses in Figs. 2A ~ 2C a plurality of bond pads (16) on the die in electrical communication with the integrated circuits and the conductors.

Regarding claim 73, Cram discloses in Figs. 2A ~ 2C the redistribution layer comprising a metal.

Regarding claim 74, Cram discloses in Figs. 2A ~ 2C the conductors being separated by etched opening. Further, as to the language on line 2, "the conductors being separated by etched opening", even though product-by-process claims are limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process. In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted). A "product by process" claim is directed to the product per se, no matter how actually made, In re Hirao, **190 USPQ 15 at 17** (footnote 3). See also In re Brown, **173 USPQ 685**; In re Luck, **177 USPQ 523**; In re Fessmann, **180 USPQ 324**; In re Avery, **186 USPQ 116**; In re Wertheim, **191 USPQ 90** (**209 USPQ 254** does not deal with this issue); and In re Marosi et al., **218 USPQ 289** final product per se which must be determined in a "product by, all of" claim, and not the patentability of the process, and that an old or obvious product, whether claimed in "product by process" claims or not. Note that Applicant has the burden of proof in such cases, as the above caselaw makes clear.

Regarding claim 75, a further difference between Cram and claimed invention is a protective layer on the conductors having a plurality of openings for the terminal contacts. However, Khandros et al. discloses in Fig. 2G and column 20, lines 47 ~ 50 a protective layer

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(cover layer of 264) on the conductors having a plurality of openings (at the bottom part of 264) for terminal contacts. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Cram by using the protective layer as taught by Khandros et al. The ordinary artisan would have been motivated to modify Cram in the manner described above for at least the purpose of providing a desired spatial relationship with one another by any suitable support structure (column 20, lines 66 and 67).

Regarding claim 76, Cram discloses in Figs. 2A ~ 2C the conductors comprising a deposited metal. Further, as to the language on line 2, "a deposited metal", even though product-by-process claims are limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process. In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted). A "product by process" claim is directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 116; In re Wertheim, 191 USPQ 90 (209 USPQ 254 does not deal with this issue); and In re Marosi et al., 218 USPQ 289 final product per se which must be determined in a "product by, all of" claim, and not the patentability of the process, and that an old or obvious product, whether claimed in "product by process" claims or not. Note that Applicant has the burden of proof in such cases, as the above case law makes clear.

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5. Claim 77 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cram and Khandros et al. as applied to claim 60 above, and further in view of Franklin et al.

Regarding claim 77, Cram and Khandros et al. disclose the claimed invention except for the conductors being configured to repair the at least one defective integrated circuits. However, Franklin et al. teaches conductors (metal strap repair line) being configured to repair the at least one defective integrated circuits. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to further modify Cram by using the conductors as taught by Franklin et al. The ordinary artisan would have been motivated to further modify Cram in the manner described above for at least the purpose of repairing a defective chip (column 8, line 21).

### ***Response to Arguments***

6. Applicant's arguments with respect to claims 52 ~ 66 and 70 ~ 77 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is (703) 305-6194. The examiner can normally be reached on M-F (10:30 - 7:00).

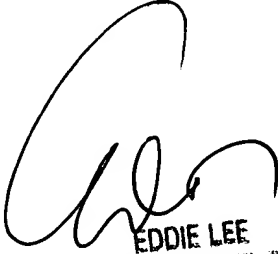
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Chris C. Chu  
Examiner  
Art Unit 2815

c.c.  
July 13, 2003



EDDIE LEE  
SUPERVISORY PATENT EXAMINER  
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